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AUTHOR Frierson, Henry T., Jr.
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ABSTRACT

The impact of providing assistance to develop test-taking skills of 19 minority medical students was studied. The intervention program consisted of 15 hours of test-taking instruction and participation in learning teams that used practice tests to reinforce test-taking skills. For two sets of second-year minority students, intervention was provided before taking part of the National Board exams. Intervention was also provided to both minority and nonminority students who had to retake part or all of the Board exams. The results showed that intervention was significantly associated with improved performance. No significant differences in performance occurred for the minority and nonminority students. The minority and nonminority group's mean scores were 452 and 491, respectively, and their respective passing rates were 79 and 89 percent. In comparison, the passing rate for 25 minority students from the previous year was 52 percent. The test-taking intervention also significantly affected performance for students retaking the exams. Examination of retest performance over an 8-year period reveals that participants in the test-taking intervention gained an average of 118 points, compared to 72 points for students not participating in the intervention. (SW)

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JUST ONE ASPECT OF AN EFFECTIVE SUPPORT PROGRAM:

Its Impact on Minority Students

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Henry T. Frierson, Jr., Ph.D.
School of Medicine
The University of North Carolina at Chapel Hill
Chapel Hill, N.C. 27514

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Just One Aspect of an Effective Support Program: Its Impact on Minority Student Performance

Henry T. Frierson, Jr., Ph.D.

University of North Carolina School of Medicine

A comprehensive support program can be critical to the academic and psychological wellbeing of medical students in general and minority medical students in particular. A good support program can help ameliorate academic pressures, thus allowing students to perform more effectively. Further, an effective program may help curb psychologically related problems. The importance of an effective support program can be viewed when the impact of one subelement is examined. In this paper a single subelement, test-taking intervention and its effects on performance, will be discussed.

The major question concerning the effectiveness of a support program within an academic setting is: How many target students are retained? This question is significant because minority medical student retention remains a critical issue--particularly since the attrition rate of minority students is substantially higher than that for the total medical school population. For example, the attrition rate for minority students is approximately 10 percent vs. two percent for the total student population; and this does not take into account repeated years and it is reported that the percentage of minority students repeating the first year is approximately 16 percent vs. three percent for nonminority students (1).

Thus, the rationale for examining support programmatic efforts effects on performance, stems from the relative lower achievement of minority students. Since it is given that many minority medical students, particularly in predominantly white medical schools, feel that they are in alien environments,

the existence of solid support programs takes on added importance. Just one component of a comprehensive support program, i.e., academic support, is related to opportunity to learn and the quality of instruction. Those variables are critical in student performance, but they are closely tied only to one component, and the makeup of an effective support program involves numerous components, of which some are:

- School leadership committed to providing support for students
- Good teaching
- Caring and sensitive faculty and administrators who have concern for students
- Presence of minorities in both faculty and high level administrative positions who are concerned about the welfare of students
- A critical mass of minority students in each class
- Personal counseling and stress management services where minority students feel comfortable and are willing participants when the need arises
- Adequate financial assistance
- Academic support
    - Under academic support are a number of elements, for example:
        - Summer academic reinforcement programs
        - Tutorial assistance
        - Academic counseling
        - Regularly scheduled review sessions
        - Services such as:
            - Note-taking services
            - Accessible test files
        - Academic skills reinforcement such as:

- Time management
- Study and learning strategies and skills for medical school: I say for medical school because most medical students find medical school to be a totally different ballgame: the average curriculum is equivalent to 28 undergraduate hours, with some schools as high as 40 hours (2)
- Effective reading skills for medical school
- Test-taking for medical school

Indeed, all of the support program component is important and most should be available to all students; the focus, however, will be one subelement of academic support--test-taking intervention--and its effects regarding performance and retention of minority medical students. The examined criteria will be scores on National Board exams or National Board subtests.

Regarding test-taking skills, many medical students, and minority students in particular, express concern about their ability to adequately take tests, particularly the National Boards or tests having similar item formats. Further, for a number of reasons, many students do not accurately demonstrate their acquired knowledge on exams (3). Thus, academic skills reinforcement focusing on test-taking warrant attention. Moreover, the effects of test-taking behavior may have such a substantive bearing that it should be acknowledged when decisions regarding student performance are made.

METHOD

I will examine two general situations involving four evaluation studies. The first situation--where intervention was provided before the administration of major exams--involved two sets of second year students. One set took Part I

of the National Boards. The other set took three subtests of Part I of the National Boards. The second situation--intervention was provided for students who were required to retake exams--also involved two sets of students. The first consisted of students who had to retake one to three National Board Part I subtests. The other comprised third year students who were required to retake the entire Part II National Board exam.

Students receiving intervention in the first two studies were all minorities. Those in the latter two studies were both minority and nonminority students, but the majority of the students were minorities.

In all four evaluation studies, the results showed that intervention was significantly associated with improved performances. Parenthetically, none of the studies were controlled experiments; two of the studies suffer from small sample size and all lack randomization. But the results are consistently indicating that intervention has a significant effect on performance, and thus warrant attention.

National Board Part I Performance

Nineteen of 21 second year minority students participated in an intervention program that consisted of 15 hours of test taking instruction and establishing learning teams. Formal intervention occurred in the spring semester and covered two and one-half days over a two month interim. The participants agreed to meet in learning groups the remainder of the semester and use practice tests to reinforce test-taking skills and for self-assessment purposes relative to content knowledge.

Relatively poor National Board Part I performances of former second year minority students had created concern, and thus one of the objectives was to reduce the performance gap between minority and nonminority students. A

randomly selected group of 19 nonminority students were selected for comparison purposes. After interventon the results showed no statistically significant differences between the participants and the nonminority group. For example, the participants' and the nonminority group's mean score were 452 and 491, respectively, and their respective passing rates were 79 percent and 89 percent. Both differences were not significant. On the other hand, the passing rate for the 25 minority students from the previous year was 52 percent, a percentage also reported to have been similar for minority students in prior years. Moreover, in assessing the impact of intervention the passing rates for all 21 minority students taking the exam during that period, 81 percent passed compared to 90 percent for the entire class, the difference was statistically negligible. In Figure 1, we can see the passing rates of the minority students and that of the class during that period as compared to the previous year.

Figure 1 goes about here

Performance on National Board Part I Subtests

These results are from an evaluation study I presented at an AAMC Meeting some years ago (4). At the beginning of the first semester, 13 second year minority students participated in six, one hour interventive sessions for six weeks. The interventive sessions emphasized test-taking instruction pertinent to National Board item types. The criterion variable was the mean score of three National Board subtests--Pathology, Pharmacology and Physiology--given as part of a year-end comprehensive final.

Ten students chose not to participate. Although the 10 nonparticipants had higher MCAT scores and undergraduate GPAs, the difference on the subtests mean significantly favored the groups receiving test-taking instructions: 444 and 364, respectively, with an effect size of 0.78 (thus 77 percent of the group

receiving intervention scored higher than the nonparticipants' mean score. The 80 point difference was significant. Further, comparing the participants with minority students from the previous year showed the results significantly favored the receiving intervention. The 14 minority students from the previous year had a mean of 368, quite similar to that of the nonparticipants (364). Figure 2 illustrates the performance levels of the three groups based on the National Board subtest means.

Figure 2 goes about here

Retest Performance

Because of previous unsatisfactory National Board test performance, a number of students were required to retake the exam. Where test-taking intervention occurred, it was also found to have significant effect when gain scores were compared. Both National Board subtests and National Board Part II performances were examined for two groups of predominantly minority second and third year medical students.

Retest Performance on National Board Part II

In examining National Boards Part II retest performance over an eight year period, 29 third year students were involved. Those students were required to retake all of Part II. Of the 29 students, 19 chose to participate in intervention consisting of test-taking skills reinforcement, and 10 chose not to. Shown in Figure 3, the 10 nonparticipants chose to use other resources offered by the school such as clinical tutorial assistance (which was also available to participants) or opted for a commercial review course. After retesting, the nonparticipants gained an average of 72 points, from 245 to 317. Despite the initial low mean, the gain was sizable given that the exam is

standardized with reported high reliability. But participants displayed a significant higher gain of 118 points, from 224 to 342. The effect size of the gain was 1.01. Thus, 84 percent of the participants had a higher gain score than the nonparticipants average gain. Figure 3 shows the test-retest performances of the two groups.

Figure 3 goes about here

Retest Performance on National Board Part I Subtests

In examining National Board Part I subtest retest performance, over a five year period, 72 second year students had to retake one to three subtests. Thirty-nine students chose to particpate in test-taking related intervention, and 33 chose to forego participation. In addition, all students had the opportunity to participate in special tutorial review sessions provided by each of the three departments--Pathology, Pharmacology, and Physiology--requiring the subtests. A large proportion of students in both groups participated in those tutorials. The test-taking reinforcement sessions were thus offered as an additional program.

The mean National Board subtest raw percentage scores were recorded for both groups because some students' standard scores were not accessible. Both participants and nonparticipants had essentially the same initial test scores, 52 percent (actually 51.8 percent and 51.9 percent, respectively). But as shown in Figure 4, the retest scores were significantly different. The participants produced a retest score of 64 percent compared to 58 percent for the nonparticipants. The gains were equivalent to standard score increases of 60 and 120 points, for the nonparticipants and participants respectively. The six percentage point difference between the two groups is hence equivalent to

approximately 60 points on the National Board subtests points, (0.60 standard deviation). The intervention was associated with an effect size of 0.82 for the gain scores; thus 88 percent of the participants had higher gains than the nonparticipants' mean.

Figure 4 goes about here

CONCLUSION

The results of the four evaluation studies all suggest that test-taking skills reinforcement was associated with higher performances. This supports the notion that effective support pays handsome dividends in the form of substantially improved performances for minority students. But of particuclar importance, the intervention discussed in this paper was only one aspect of academic skills reinforcement, and academic skills reinforcement in turn was only one of many components that should comprise an effective support system. Most support program components are important for all students, but may have particular significance for minority students. Based on the results suggested here, minority students benefitted by the conditions of a full functioning support system should ilourish in medical school, by any measure.

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3. Nunnally, J. C. Psychometric Theory (2nd Ed.) New York: McGraw-Hill, 1978.

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FIGURE 1

Two Year Comparison of NB-1 Passing Rates

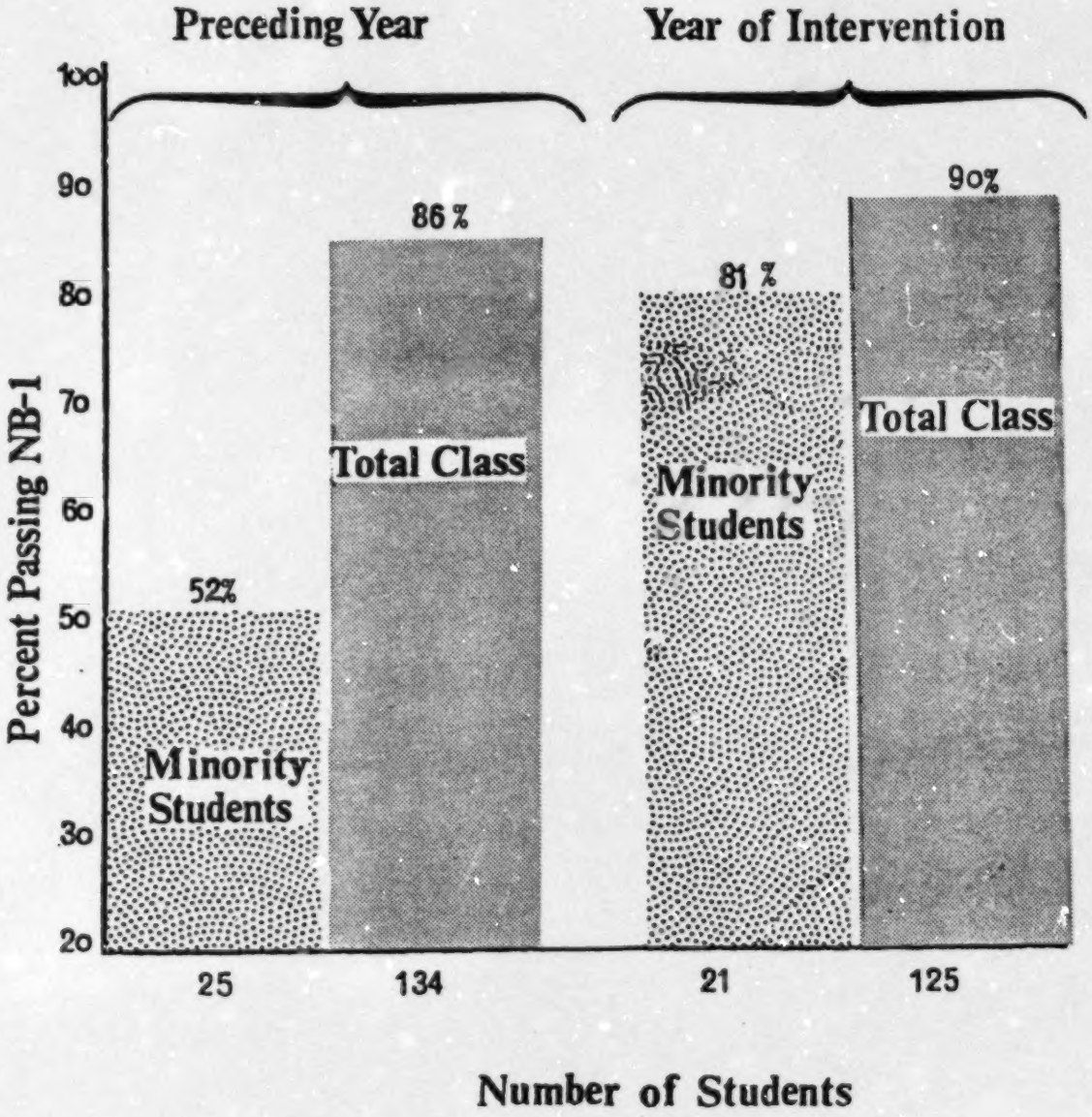

FIGURE 2

A Comparison of NB-1 Mean Subtest Performance

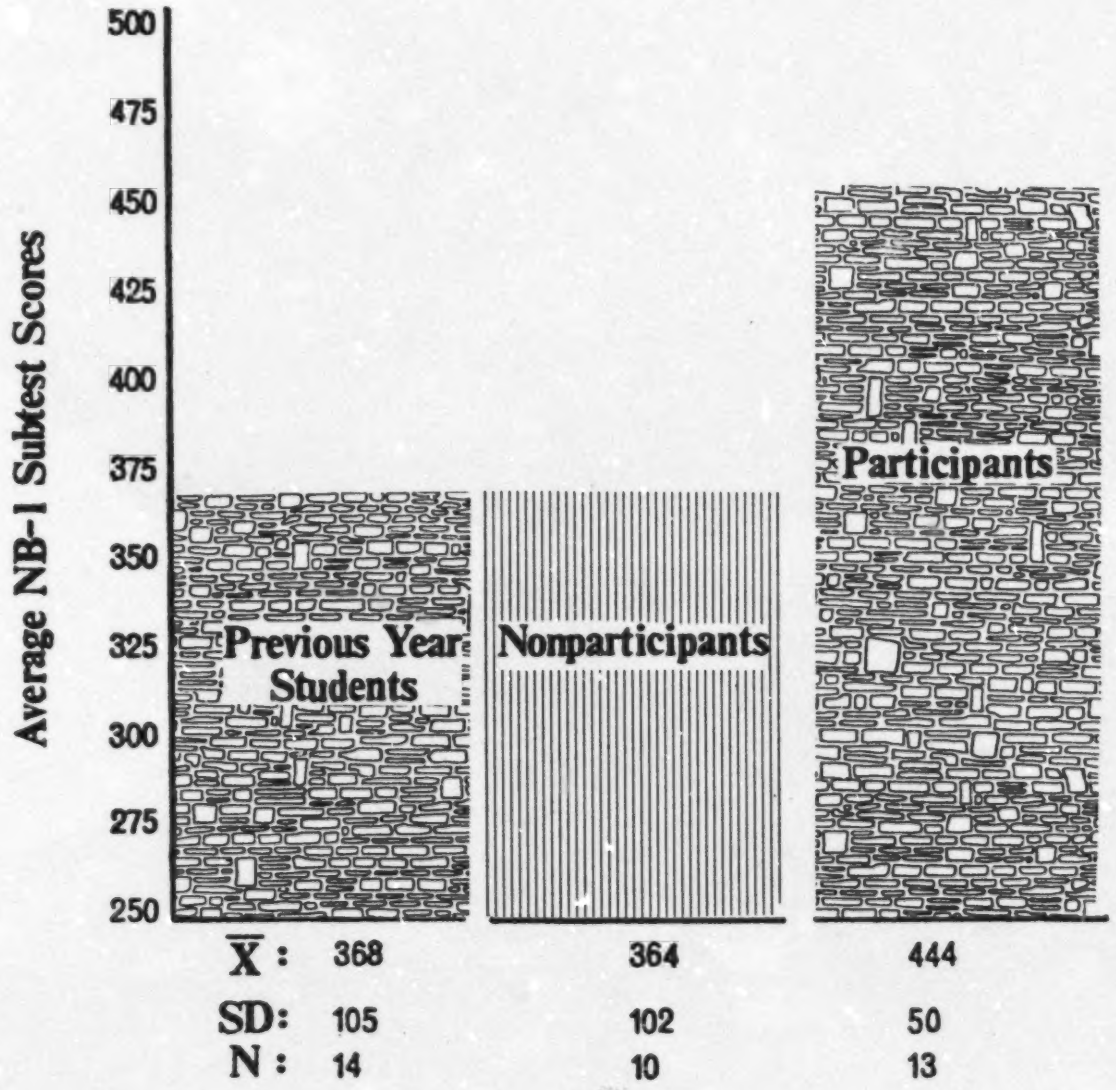

FIGURE 3

A Comparison of Mean NB-11 Gain Scores

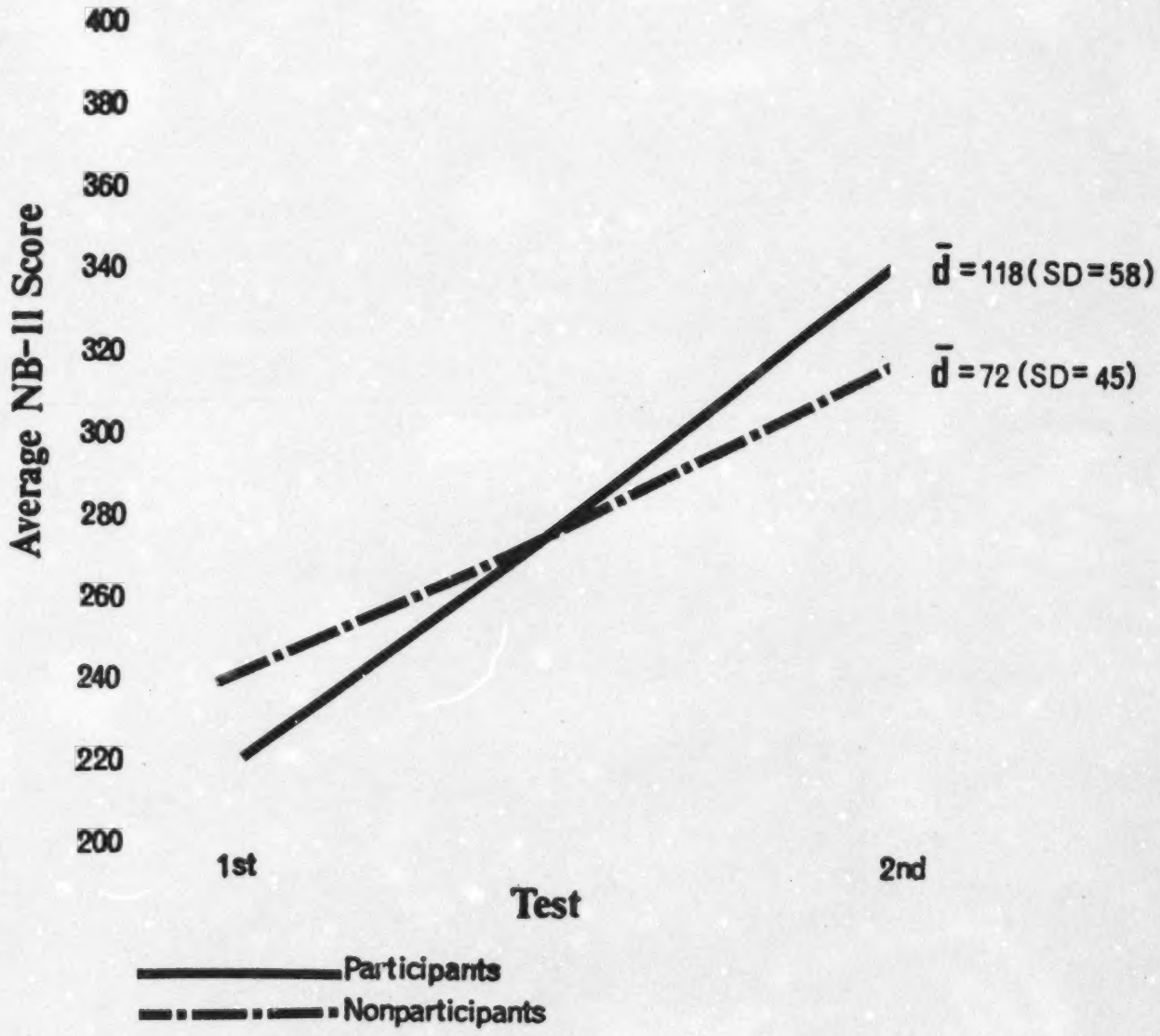

FIGURE 4

A Comparison of Mean NB-1 Subtest Gain Scores